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Objections to the Drawings

The drawings have been objected to because as stated in the Office Action "they fail to show a metal layer (i.e. 54A in Figure 5A) having a combined thickness of 28A plus 54A before being etched as described in the specification to form bumped contacts."

However, the metal layer 54A in Figure 5A is not used to form bumped contacts. The bumped contacts 16 (Figure 2C) are on the component 18. As described at page 15, lines 16-25, the metal layer 54A (Figure 5A) is used to etch blades 28A. The objection to the drawings appears to be based on the observation that the metal layer 54A in Figure 5A should have a thickness equal to the thickness of the metal layer 54A and the blades 28A in Figure 5B.

In response to the objections to the drawings, enclosed is a corrected drawing sheet (sheet 5 of 10) in which Figure 5A has been amended, such that the metal layer 54A has a thickness which is equal to the combined thickness of the metal layer 54A and the blades 28A in Figure 5B. Also enclosed is a corrected drawing sheet (sheet 7 of 10) in which Figure 7A has been amended, such that the metal layer 54B has a thickness which is equal to the combined thickness of the metal layer 54B and the blades 28B in Figure 7B.

In view of the corrected drawing sheets the objections to the drawings are submitted to have been overcome.

Rejections Under 35 USC §112

All of the claims have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In support of these rejections the Office Action states: "The preamble of the independent claims are vague

and indefinite. The preamble should recite that an interconnect is fabricated for engaging a bumped contact formed on a semiconductor component."

In response to the 35 USC §112 rejections, the preambles of claims 34, 39 and 49 have been amended as suggested above. Support for these amendments is contained on page 4, lines 4-7 of the specification.

Summary Of The Invention

Independent claims 34, 39 and 49 are directed to a "method for fabricating an interconnect 10 (Figure 1) for engaging a bumped contact 16 (Figure 2C) on a semiconductor component 18 (Figure 2C)". The method is shown in Figures 7A-7G. As shown in Figure 7A, an insulating layer 24B and a metal layer 54B are formed on a substrate 14B. As shown in Figures 7B and 7C, leads 22B having blades 28B thereon are formed using the metal layer 54B. As shown in Figure 7B, a non-bonding outer layer 46B can be formed on the metal layer 54B and on the blades 28B using a deposition process such as CVD, electrodeposition, or electroless deposition of a metal or a conductive polymer (page 19, lines 5-9 of the specification).

As shown in Figure 7H, the leads 22B include a connecting segment 40B. As shown in Figure 7F, a recess 20B is formed in the substrate such that the leads 22B are cantilevered over the recess 20B. As shown in Figure 7F, a conductive via 42B is formed in the substrate 14B in electrical communication with the connecting segment 40B, and a contact 38B is formed on an opposing side of the substrate 14B.

Rejections Under 35 USC §102 and 35 USC §103

Claims 34-35, 38-39, 43 and 49-51 have been rejected under 35 USC 102(b) as being anticipated by Fjelstad et al (US Patent No. 5,632,631).

Claims 40-41 have been rejected under 35 USC 103(a) as being unpatentable over Fjelstad et al. (US Patent No. 5,632,631) in view of Banba et al. (US Patent No. 6,406,774) and further in view of Grabbe et al. (US Patent No. 5,131,852).

Each of the independent claims has been amended to recite a combination of steps that are not taught or suggested by Fjelstad et al. '631, making all of the claims both novel and unobvious over Fjelstad et al. '631.

Amended independent claim 34 recites the step of "forming an outer layer on each lead configured to provide a non-bonding surface for the bumped contact." Amended independent claim 39 recites the step of "forming an outer layer on the metal layer configured to provide a non-bonding surface for the bumped contact". Amended independent claim 49 recites the step of "forming an outer layer on each lead configured to provide non-bonding surfaces for the bumped contacts." Antecedent basis for these recitations is provided on page 19, lines 5-9, and on page 13, lines 27-29 of the specification.

The dependent claims have also been amended to include recitations that are not taught or suggested by Fjelstad et al. '631. Amended dependent claim 35 states that the "outer layer comprises a material selected from the group consisting of Ti, $TiSi_2$, Al and a conductive polymer." Amended dependent claims 40 and 50 state that the "outer layer comprises a conductive polymer." Antecedent basis for these recitations is contained on page 13, lines 30-32

of the specification. Amended dependent claim 41 recites that the "outer layer comprises a material selected from the group consisting of a carbon film and a metal filled silicone." Antecedent basis for this recitation is provided on page 14, lines 1-2 of the specification.

Fjelstad et al. '631 teaches a cap metal 34 (Figure 3) on the contacts 20 at column 8, lines 25-30. However, the cap metal 34 is selected to provide an etch resistant surface (column 8, lines 26-27). In addition, Fjelstad et al. teaches at column 10, lines 12-55, the step of bonding the contacts 20 to the bump leads 72. Further, Fjelstad et al. '631 teaches that the cap metal 34 can comprise a bonding metal (column 10, lines 53-55). Fjelstad et al. '631 thus does not teach the step of forming a non-bonding outer layer, but rather teaches away from this step.

With respect to the 35 USC §103 rejections of claims 40-41, both of these claims have been amended to patentably distinguish from the cited combination of references. In particular, claim 40 states that the outer layer 46B (Figure 7B) comprises a conductive polymer. Claim 41 states that the outer layer 46B (Figure 7B) comprises a material selected from the group consisting of a carbon film and a metal filled silicone. Antecedent basis for these recitations is contained on page 14, line 1 of the specification.

Conclusion

In view of the above arguments and amendments, favorable consideration and allowance of claims 34-35, 38-41, 43 and 49-51 is respectfully requested. Should any issues arise that will advance this case to allowance, the Examiner is asked to contact the undersigned by telephone.

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Respectfully submitted:

STEPHEN A. GRATTON
Registration No. 28,418
Attorney for Applicants

2764 S. Braun Way
Lakewood, CO 80228
Telephone: (303) 989-6353
FAX (303) 989-6538

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May 23, 2003
Date of Signature

Stephen A. Gratton, Attorney for Applicants